REMARKS

The claims have been amended to point out the invention more clearly. As set forth in claim 1, from which all other claims depend, the herbal chip must have a plastic slide which is first derivatized with a polyfunctional aldehyde which, in turn, is reacted with a compound which will provide a free NH_2 group, which is, in turn, reacted with a compound containing at least two epoxide moieties, one of which binds the free NH_2 group now coupled to the slide and the other which binds a functional group in the components contained in the herbs. Support for this clarification is found, for example, in the specification on page 5, lines 12-31. The remaining claims have been adjusted to accommodate this clarification. No new matter has been added and entry of the amendment is respectfully requested.

The rejection of claims 16-21 as indefinite has been obviated by amendment; the phrase "massive amount" no longer appears in the claims.

The Art Rejection

All of the art rejections depend on the combination of Chang, *et al.*, with Vermeulin, *et al.*; claims 1-9, 11, 16-19 and 22-24 are rejected on this combination alone.

The addition of claims 10 and 20 to this rejection apparently is thought to require the addition of Gerster; the addition of claims 12-15 and 21 results in the addition of Cruickshank . Since the limitations of claims 12-13 have been added to claim 1; it is believed that the tripartite combination of Chang, Vermeulin and Cruickshank is required now to be applied to all claims.

Chang is cited as describing the preparation of compounds from herbs. This is an interesting interpretation of the thrust of the disclosure of Chang. Chang is actually focused on specific thiophene-based compounds which, for the most part, are prepared synthetically as described in the multiple examples. Chang remarks only in column 3, lines 40-60, that it is possible to isolate some of these compounds from *Echinops grijisii*. It will be noted that the Chang document is, to the extent that it is related to extracts from herbs at all, devoted to the isolation of particular desired compounds therefrom, and not assessing the extracts of herbs for

components or fractions contained therein which may be metabolically active and/or hitherto undiscovered. Thus, Chang comes rather close to being non-analogous art as focused on specific pharmaceutical compounds, which happen to be isolatable from a particular herb, rather than to exploring herbal extracts for biologically active compounds in general.

Vermeulin, too, is focused in an entirely different direction from the present invention. It might be considered non-analogous art as well. The focus of Vermeulin is to prepare a polyamine library in order to obtain analogs with desirable activities for diagnostic and research assays and therapy (see the Abstract). To the extent that the polyamines are attached to supports for use in assay systems, it is the polyamines themselves that are to be used as the reagents; they are not amine-providing compounds for use as linkers to capture compounds from any other source, including herbal extracts. Rather, the focus of the assays to which the Office points in columns 33-38 is to discover those materials which react with the polyamines themselves.

The present invention is directed to materials and methods which are useful in identifying compounds in components or fractions of herbs which have biological activity. In order to make this assessment, the component or fraction is first supplied on a solid support and then tested to see whether it reacts with a biological probe. (See claims 22-24.) It is not the herbal extracts themselves which are used as probes to test their reactivity with anything coupled to the solid support, much less the amine-supplying compound which is used as a linker.

Thus, even if Vermeulin and Chang are combined, they fail to suggest the invention as claimed. Chang, if one looks hard, may be said to disclose a particular herbal extract; there is no suggestion in Chang that the herbal extract be in any way assessed for various components. Vermeulin describes methods to assay a library of polyamines having nothing to do with herbal extracts, or any other component which is linked to a support through a polyamine.

Not only does the invention not result from this combination (leaving aside the requirement for a bifunctional epoxide) there is no motivation to combine these documents. The Office asserts that the motivation lies in the efficiency achieved by high throughput assays on

solid supports; however, Vermeulin is not directed to such assays with respect to anything other than polyamines.

As set forth in *In re Rouffet*, 47 USPQ2d 1453 (Fed. Cir. 1998), there are only three reasonable bases for combining documents to support a rejection - a suggestion in the documents themselves, a problem delineated common to the documents, or the high profile character of at least one of the documents. There is no suggestion in either document that they be combined; the overall teachings of Vermeulin are not related to high throughput assays, and high throughput assays are totally unrelated to any problem addressed by Chang. Neither document is particularly well known. Accordingly, there is no supportable motivation for combining Chang with Vermeulin.

As noted above, as the limitations of claims 12 and 13 have been added to claim 1 and as it is acknowledged that these claims are not made obvious by the combination of Chang and Vermeulin alone, a full response to the rejection must consider the addition of the Cruickshank document. This document is cited as putatively disclosing epoxide-based linkers.

Cruickshank is said to teach a polyfunctional epoxide on a chip that reacts with hydroxyl, sulfhydryl or amino groups. In order to defeat patentability of the present invention, however, Cruickshank needs to teach more than that. Cruickshank teaches the use of epoxy compounds as linkers on glass supports (specifically eschewed by the present invention) to nucleic acids, not herbs. There is no motivation at all to combine Cruickshank with the remaining documents. Respectfully, the motivation proposed by the Office fails to meet the tests set forth in *In re Rouffet*. The motivation seems to lie simply in the fact that it would be possible to make the substitution of a plastic surface derivatized first to a polyfunctional aldehyde and then to an NH_2-containing precursor for a glass support and an herbal extract for a nucleic acid composition. These substitutions, according to the teachings of the invention, are possible to be made, but where is the motivation to make them? It lies only in the teaching of the invention.

This is made evident by the fact that Chang fails to teach an herbal extract which is to be assayed for its components and Vermeulin fails to teach a solid support to which is bound first a

polyfunctional aldehyde, then an NH_2-bearing linker. Vermeulin, instead, teaches combinatorial libraries displayed on solid supports. Accordingly, the rejection over Chang in combination with Vermeulin and further in combination with Cruickshank as necessitated by the amendment to claim 1 may properly be withdrawn.

Claims 10 and 20, according to the reasoning of the Office, are obvious over Chang and Vermeulin in combination with Gerster. Applicants assume that as to the amended claims, the Office would propose the rejection further to include Cruickshank. Gerster, again, appears completely off point. The disclosure is directed to specific compounds for pharmacological use. Because claims 10 and 20 require the use of aqueous ammonia, the Office has surveyed the 22 columns of the Gerster patent and found mention, in an entirely different context, of ammonium hydroxide as an aminating agent. There is no suggestion whatsoever in Gerster that aqueous ammonia be used as an aminating agent in any other context than that of the preparation of the compounds of interest to Gerster. There is no reason whatsoever, even after the fact, to combine the teachings of Gerster with those of Chang, Vermeulin and Cruickshank.

Accordingly, this combination does not render claims 10 and 20 obvious.

CONCLUSION

The claims as amended more particularly point out the invention by focusing on the manner in which the plastic supports for herbal extracts are prepared. Respectfully, the Office has not cited a single document which even purports to address the problem solved by the present invention - to detect biologically active compounds and herbal extracts. The section of Chang relied upon instead relates to the preparation of known compounds from a particular herb. Vermeulin, cited by the Office as describing high throughput assays, does not address finding unknown compounds from herbal extracts, but rather in testing materials for their reaction with polyamines. It is the polyamines that are displayed and tested on a plastic surface. Vermeulin is focused in an entirely different direction from Chang, and there is no motivation to combine them without using the present invention as a guide. This is even more the case with respect to

the addition of Cruickshank, where the use of bifunctional epoxides as a linker is set forth in an entirely different context. As all three documents must be combined to formulate the rejections as they presently stand with regard to the claims as amended, applicants believe this rejection should be withdrawn. Accordingly, it is believed that the presently pending claims, claims 1-7, 9-10 and 14-24 are in a position for allowance and passage of these claims to issue is respectfully requested.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorize the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket No. 205032000500.

Respectfully submitted,

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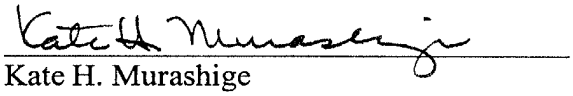
By: 

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EXHIBIT A. - VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

1. (Amended) A herbal chip comprising a plastic slide, a coating [as a spacer] on the plastic slide[, and] which binds fractions or components obtained from herbs [that are] to said slide in independently allocated [in] microarrays on the coating, wherein said coating comprises a polyfunctional aldehyde coupled to said slide to which is coupled a compound which provides at least one NH_2 group, to which is bound a polyfunctional epoxide compound comprising at least one epoxide for coupling to said amino group(s) and at least one epoxide for coupling to an herbal fraction or component.

9. (Amended) The herbal chip as claimed in claim [8] 1, wherein the polyfunctional aldehyde is glutaldehyde.

10. (Amended) The herbal chip as claimed in claim [8] 1, wherein the NH_2 group(s)-providing [precursor] compound is NH_4OH.

14. (Amended) The herbal chip as claimed in claim [12] 1, wherein the epoxy group(s) [at the other end of the polyfunctional epoxide] which couple to the herb components or fractions react with the free hydroxyl, sulfhydryl or amino groups[of the ingredients contained in herbs].

15. (Amended) The herbal chip as claimed in claim [12] 1, wherein the [polyfunctional] epoxide compound contains a long chemical chain of 6 to 24 carbon atoms.

16. (Amended) A method of producing the herbal chip as claimed in claim 1, comprising the step[s] of [preparing a plastic slide, coating the surface of the plastic slide with polyfunctional molecules, and spotting and immobilizing on the coated plastic slide a massive amount of samples in a gridded area in microarrays, wherein each of samples contains homogeneous or heterogeneous fractions or ingredients obtained from a herb] coupling the herbal fractions or components to said epoxide for coupling to an herbal fraction or component.

18. (Amended) The method as claimed in claim 16, wherein [the plastic slide is pretreated with a] said coupling is preceded by the steps of treating the slide with said polyfunctional aldehyde followed by soaking in a solution of said NH_2 [group(s)]-providing [precursor before coating the plastic slide] compound, and treating with said polyfunctional epoxide compound.

20. (Amended) The method as claimed in claim 18, wherein the NH_2 [group(s)-]providing precursor is NH_4OH.

21. (Amended) The method as claimed in claim 16, wherein the polyfunctional [molecule is a polyfunctional epoxide containing] epoxide compound contains at least one epoxy group at each of its ends.